SkyScoop

The Newsletter of the National Weather Service in Wilmington, Ohio

National Oceanic and Atmospheric Administration (NOAA) -- US Department of Commerce (DOC)

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Tornado Touches Down at the National Weather Service

Andy Hatzos

Looking southeast at a developing wall cloud in a tornado-warned storm for Butler, Hamilton, Warren and Clermont counties. ***Photo courtesy of Glenn Johnson***

A round of powerful thunderstorms developed across the Tri-State region and southern Ohio during the evening of May 30, 2009. Three tornadoes were confirmed, including one very near the NWS office in Wilmington, and numerous reports of large hail were also received.

A warm front stretched diagonally across the region, roughly from Richmond, Indiana to Chillicothe, Ohio. This front helped act as a focus for convective development across the region. Strong northwest winds in the upper atmosphere, combined with clockwise-turning winds in the lower atmosphere, created a favorable wind shear environment for severe thunderstorms and tornadoes. The low freezing levels aided in the development of large hail as well.

A few thunderstorms developed during the late afternoon hours across southern Ohio and northeast Kentucky. Two reports of 0.75 inch hail were received from near Vanceburg in Lewis County at around 5:00 pm.

The main round of convection formed after 7:00 pm in the Cincinnati area. These thunderstorms quickly became organized as supercells, and began producing severe weather as they moved east-southeast across the region. Large hail accompanied almost every thunderstorm, with the largest report of the event – 1.50 inches – coming from Bethel, Ohio shortly after 8:30 pm. There were very few reports of strong straight-line winds.

The three tornado touchdowns across the region were perhaps the biggest story from the event. The first tornado touched down in Bethel at 8:44 pm. The thin tornado was captured on video by a trained spotter as it moved across the southwest side of the village. Damage was minimal, with one or two tree limbs downed.

The second tornado touchdown occurred no more than a quarter mile from the NWS office in Wilmington. Meteorologists watched the supercell thunderstorm as it approached the office, and noted a well-defined rotating wall cloud. A tornado proceeded to touch down just northeast of the office in a farm field. No condensation funnel was visible, but dust and debris from the field was kicked up and clearly spinning, indicating that the rotating column of air was indeed in contact with the

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INSIDE THIS ISSUE:

A Letter from the Warning Coordination Meteorologist

Hello Spotters and Emergency Managers,

As we approach the end of the summer and the beginning of fall, time seems to be flying by faster and faster. It has been an eventful year so far in our forecast area. The weather events this year have included snow and ice storms, severe weather, and an unseasonably cold July in many part of our forecast area. You will find information on some of these events included in this newsletter.

I would like to extend a warm welcome to our new spotters and emergency managers and to extend our appreciation to all of our volunteer spotters for the reports you have provided. These ground truth reports are so vital to the warning process and help save lives.

In February of this year, Ohio became the 39th state to join the Collaborative Rain, Hail and snow Network (CoCoRaHS). The states of Kentucky and Indiana were already members of CoCoRaHS. This newsletter contains a very informative article on CoCoRaHS and I would encourage you to join the network if you are interested. The network provides rain, snow and hail reports which are very useful for ground truth, both in real time and for research on events. Information on how to join CoCoRaHS can be found in the article on Page 5.

On Page 7 you will find information on an event which occurred on July 11th, 2009. This event provides an example of how important a strong partnership between local, county, state, and federal agencies or entities is in the effort to save lives and protect property.

The StormReady program continues in the Wilmington Weather Forecast Office area of responsibility. During the past year, Licking County, Ohio was recognized as a StormReady county and the Cincinnati Reds Major League Baseball team at the Great American Ballpark was recognized as a StormReady Supporter. This was a great accomplishment on the part of Licking County and the Cincinnati Reds. Take a look at the article on Page 8 for more details on the Cincinnati Reds StormReady Supporter recognition.

We hope that you enjoy this issue of the newsletter. If you have any ideas for articles for the next issue, please submit them to the webmaster. You can find the address on the bottom of the front page. We would like to hear your ideas.

Again, I would like to extend our thanks for all the severe weather, rainfall, and snowfall reports you have provided. This ground truth information is so important. Please keep the severe weather safety guidance in mind at all times. Your safety is one of our highest priorities.

Regards,

Mary Jo Parker
Warning Coordination Meteorologist
National Weather Service
Wilmington, Ohio

Got an Exciting Weather Photo? We Want to Hear from You!

The National Weather Service in Wilmington wants to make it possible for weather spotters across the region to showcase their photos to the world! Pictures may be used in future editions of this newsletter, for spotter training, and in the photo gallery on our website. To participate, send your photos or any other questions to **spotreport.iln@noaa.gov.** Remember to express your permission for your credited work to be displayed on our website, used in this publication, or featured in a spotter training presentation.

Please be careful! Lightning, flooding, tornadoes, and ice storms make for great photography -- but great danger as well. The staff of the National Weather Service urges everyone to respect the weather and take photographs only when it is safe to do so.

February 3 Tri-State Snowfall

John Franks

A clipper system tracked through the Upper Midwest and took aim on the Ohio Valley on the morning of Tuesday, February 3rd. As a rule, these clipper systems typically produce an inch or two of snow as they race through the region and usher in much colder air behind them. This clipper had a bit of extra help, in the form of a boundary that set up from just west of Richmond, Indiana, through eastern Cincinnati, and along the Ohio River towards Maysville, Kentucky. The boundary acted as a focal point and a narrow band of snow approximately 20 miles wide developed. In addition to the boundary, a slow-moving surface low also provided an extra kick to this snowfall event, enabling the atmosphere to wring out significantly more moisture than normal.

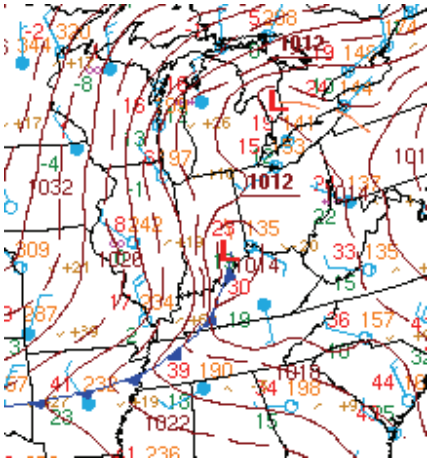


Figure A

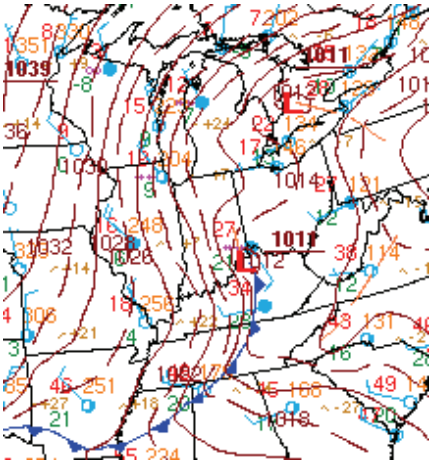
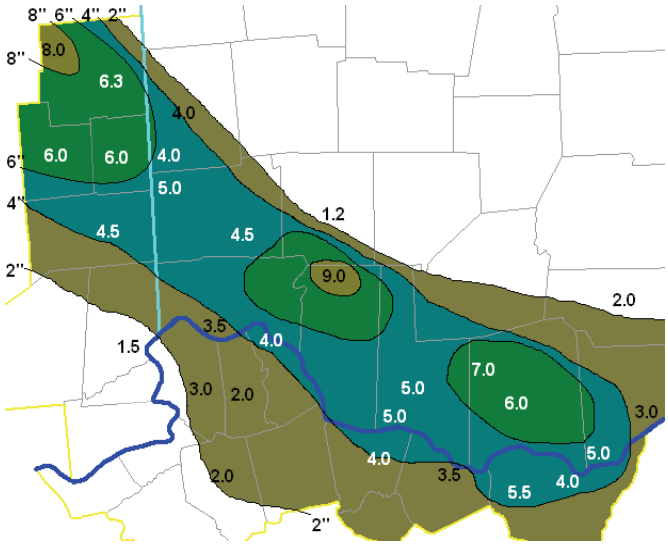


Figure B



Contour map of snowfall totals (inches) from February 3.

With the combination of the low moving slowly southeast and the clipper moving through at the same time, snowfall rates exceeded two inches per hour in many locations along this narrow boundary. Snowfall rates of this magnitude are exceedingly rare as the necessary ingredients to sustain them do not typically line up, nor linger for any significant length of time when they do.

Note the position of the low at 10:00 am (Figure A) and see that it had barely moved east by a few miles by 1:00 pm (Figure B). At the Cincinnati International Airport (CVG), the temperature at 1:52 pm was 26º with a wind out of the south-southeast at 13 mph. Seventeen minutes later, wind was from the west at 20 mph and the temperature had fallen to 19º, indicating the passage of the surface low.

The combination of the slow moving surface low, clipper, and boundary allowed for uncharacteristically strong upward motion and prolonged very heavy snow along it. In the matter of just a few hours, six to nine inches of snow fell, but only along the boundary. Just ten to twenty miles to the northeast of the heaviest band of snow, less than an inch fell from this system.

Huge snowflakes fall in Goshen, OH. Heavy snowfall across the Tri-State made for a disastrous evening commute across the Cincinnati Metro.
Photos courtesy of Mark Fenbers (NWS Employee).

Unseasonably Cold July in the Ohio Valley

Mike Ryan

A persistent upper low pressure system centered over the eastern United States contributed to a cool, unsettled weather pattern for the Ohio Valley for much of July 2009. Cincinnati experienced their coldest July on record, with the average temperature being a little over a half degree cooler than the previous record set in 1947. The average temperature of 70.1 degrees was over six degrees below normal. At Dayton, the average temperature of 69.6 degrees for the month was almost five degrees below normal and was good for the second coldest July on record. The coldest July average temperature was recorded in July 1947 at 69.2 degrees. Columbus recorded an average temperature of 71 degrees, making this July the fourth coldest on record and about four degrees below the July normal. Records at each of the three cities extends back into the late 1800s.

Columbus		
Rank	Average T	Year
1	70.0	1891
2	70.5	1971
3	70.9	1920
4 (t)	**71.0**	**2009**
4 (t)	71.0	1947

Cincinnati		
Rank	Average T	Year
1	**70.1**	**2009**
2	70.7	1947
3	71.4	1891
4	72.1	1996
5 (t)	72.2	1950
5 (t)	72.2	1984

Dayton		
Rank	Average T	Year
1	69.2	1947
2	**69.6**	**2009**
3	69.9	1984
4	71.6	2007
5	71.9	2000

The top five coldest months of July in Columbus, Cincinnati, and Dayton.

Tornado at NWS in Wilmington

(continued from page 1)

ground. The tornado lifted as it approached the end of the north runway at the Wilmington airport, with no damage reported.

The same thunderstorm produced another tornado about four miles south-southeast of Wilmington. A number of large limbs were downed, with some structural damage to a shed and a barn.

Due to the amount of wind shear in the atmosphere, some supercell thunderstorms were able to "split" – literally turning into two separate thunderstorms, with one moving to the left of the original motion, and one moving to the right. While the left-moving storms continued to produce large hail, the right-moving storms maintained even greater organization. Both of the tornadic thunderstorms from this event were right-moving storms from supercell splitting events.

In all, 10 tornado warnings and 18 severe thunderstorm warnings were issued. Three tornadoes were confirmed, with all three rated EF0 on the Enhanced Fujita Scale.

A shed is damaged from an EF0 tornado which touched down twice near Wilmington. ***Photo courtesy of Charlie Woodrum (NWS Employee).***

CoCoRaHS comes to Ohio

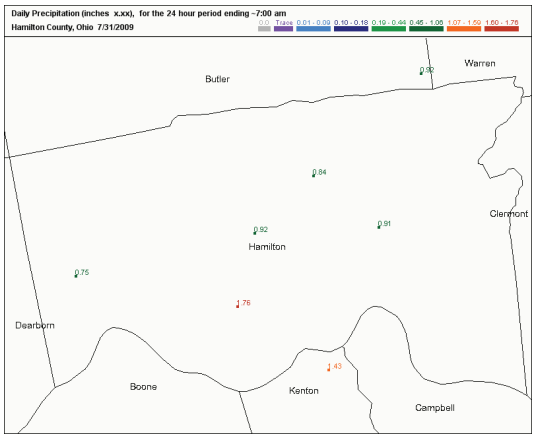
Julia Dian-Reed

On February 2nd (Groundhog Day), Ohio became the 39th state to join the Collaborative Rain, Hail and Snow Network (CoCoRaHS). CoCoRaHS was launched in Colorado in 1998 as a local project by Colorado State Climatologist Nolan Doesken following a devastating flash flood in Fort Collins. Intense rainfall causing the flash flood fell in between existing rain gages. Since then, several new states have come on board every year. The program now boasts over 12,000 volunteer observers nationwide. This grassroots network of observers measures and reports rain and snow amounts to provide the maximum amount of data for education and research use.

An example of a 4 inch rain gage used to take observations for CoCoRaHS.

Since that time, a total of 264 Ohio volunteer observers have come online to supply much-needed supplemental precipitation data. In 2009 alone, CoCoRaHS volunteer observers have aided in forecaster decision making and in determining the accuracy of radar rainfall estimates.

On the date after launch, the Cincinnati tri state experienced a mesoscale (small scale) heavy snow event in which CoCoRaHS observer 'Cincinnati 7.3 NE' came in as the high report of the storm with 7.8 inches of snow. This event developed rapidly, and contacts early in the day to existing CoCoRaHS observers in Indiana revealed the magnitude of the event as it was unfolding. This information was critical – allowing forecasters to upgrade the existing Winter Weather Advisory to a Winter Storm Warning.



CoCoRaHS observer reports from Hamilton County, as seen on the CoCoRaHS web page.

The benefits of CoCoRaHS are certainly not limited to snow reports. An active June pattern resulted in several severe and flash flood events within Ohio. On June 2, during an active evening with numerous large hail reports, Preble county observer OH-PB-1 came in with the largest hail report of ping pong ball sized hail (1.5 inches).

Later that same night, with an additional hail-producing storm pushing into the Cincinnati area, heavy rainfall prompted a flash flood warning. While there is an existing dense network of automated rain gages across Hamilton county, these 'tipping bucket' rain gages tend to report as much as 20% low during torrential downpours, as the mechanism of the automated gage is not able to keep up. With CoCoRaHS observers using an inexpensive but accurate 4 inch standard rain gage – rainfall catch is typically more reliable during very heavy rain events. The observation from CoCoRaHS observer 'OH-HM-3' came in with the heavy rain report of the event with 2.91 inches total. More recently, during the August 4 flash flooding in southeast Indiana and northern Kentucky, Ripley county Indiana CoCoRaHS observer 'IN-RP-4' reported a storm total value of 4.48 inches, much of which fell during the late morning hours. Such reports assist greatly during post-analysis of rainfall events to determine how well the radar is performing. They fill in 'holes' where no ground truth exists.

To learn more about CoCoRaHS, or if you are interested in becoming an observer, visit CoCoRaHS.org.

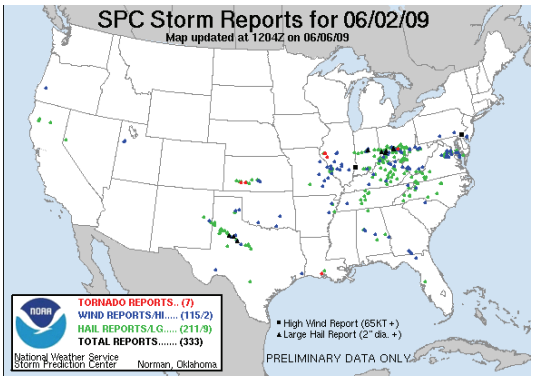
COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK

"Because every drop counts"

June 2nd Severe Weather

Charlie Woodrum

A late-Spring pulse thunderstorm event developed quickly during the afternoon and evening hours of June 2nd. A few severe, hail producing thunderstorms initially developed across northern Kentucky. Coverage then quickly increased closer to a boundary across central and southern Ohio. During a period from 2:00 pm until midnight on June 2nd, the WFO in Wilmington, Ohio (ILN) issued 35 severe thunderstorm warnings, 2 tornado warnings, and 1 flash flood warning. The event was highlighted by two noteable, rotating supercell thunderstorms which developed along the boundary and produced widespread large hail, wind damage, and a brief tornado touchdown.

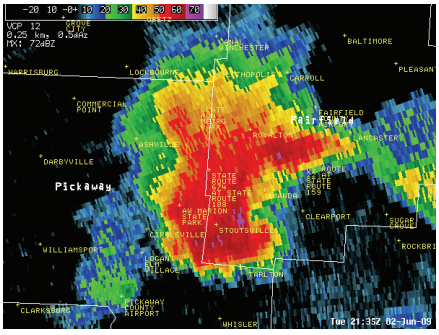


SPC storm reports from June 2nd

Golf ball size hail in Centerville, IN. ***Photo courtesy of Gary Locke.***

The first storm originated just north of Indianapolis in eastern Marion County. This storm produced hail which did vehicle damage in its early stages as it trekked across east-central Indiana. Golf ball sized hail was reported with this storm in Centerville, Indiana. The storm began to demonstrate rotation as it crossed into Preble County, Ohio, prompting a tornado warning. There were no reports of funnel clouds or tornadoes with this storm. However, the storm continued to drop golf ball size hail as it continued through Preble and Montgomery Counties. There were even a few reports of hail as large as hen egg size (2.00 inches). Wind damage occurred across portions of Clinton County and the storm crossed directly over the National Weather Service office where a wind gust of 68 mph was recorded along with dime size hail. A barn was partially damaged next to the office. The storm finally weakened in southern Fayette County. The final report of hail with the storm occurred at 7:50 pm, over 4 hours after warnings were first issued with the storm.

The second storm developed just west of Dayton. The first report of hail with the storm was received north of Beavercreek, where 1 inch hail was reported. As the storm moved into Pickaway County, it produced a microburst with several homes damaged in Darbyville. After a cell-merger occured, the storm took on more supercellular characteristics north of Circleville, with a well-defined circulation. The storm developed a rear-flank downdraft in extreme southeast Fairfield County which caused microburst damage in the Stoutsville community. A short-lived hook echo was evident just south of Amanda, which is where a brief tornado touchdown was observed. The storm finally began to weaken in Hocking county, where wind damage downed trees on several roads. This storm tracked for nearly 90 miles across central Ohio with hail as large as 2 inches in diameter accompanied by strong winds which did significant damage to several homes and vehicles.



Radar reflectivity of the hook echo signature which correlated with a brief tornado touch down in Amanda (left). The vinyl siding of a home is severely damaged from 2" diameter hail in Pickaway county (right). ***Photo courtesy of Jim Bingman.***

The June 2nd severe weather outbreak proved to be an event where the best instability, wind shear, and forcing were in phase along and just south of a frontal boundary. Aside from the two main storms featured, several additional storms produced damaging hail across central and southern Ohio. The event was anticipated, as the Storm Prediction Center highlighted the threat for severe weather well in advance, starting on May 31, with its Day 3 Outlook. Fortunately, despite the extensive damage from this outbreak, no fatalities were reported.

Porter Township Fire Department and Baseball Tournament Officials Act Quickly and Save Lives

Charlie Woodrum

A high-precipitation supercell thunderstorm developed ahead of a cold front in Ross County, Ohio on the afternoon of Saturday, July 11th. The storm first prompted a tornado warning from the National Weather Service in Wilmington, Ohio at 3:48 pm. The storm continued to develop and intensify as it took a right-ward turn and dove southward, producing tornadoes and significant straight line wind damage across Ross and Pike counties. At 4:22 pm, a third tornado warning was issued by the National Weather Service for southeastern Pike and Scioto counties. This warning included Porter Township in Scioto County, where the District 11 State Baseball Tournament was occurring. The Porter Township Fire Department sounded tornado sirens for the area at 4:28 pm. Upon hearing the sirens at the baseball tournament, officials suspended games in progress and released players to their guardians. Players, officials, and spectators took quick action, evacuating to hotels and the homes of local participants.

Baseball dugouts destroyed at the Wheelersburg Little League baseball fields. ***Photo courtesy of WSAZ.***

The storm advanced into Scioto County, and although rotation had weakened on the storm, damaging winds, large hail, flash flooding, and cloud-to-ground lightning were still threats to be taken seriously. When the storm reached the Wheelersburg Little League complex, damage was extensive to the baseball field, dugouts, and stands. Four dugouts were blown out and destroyed, and awnings were ripped off of facilities. A storm survey conducted the next day by meteorologists from the National Weather Service in Wilmington, OH estimated straight-line winds from the storm to be in excess of 90 mph. Extensive rain from the storms also flooded the fields of the complex. Despite the significant damage to the baseball complex, no injuries were reported. After the event, Kim Carver, Scioto County Emergency Manager praised the Weather Forecast Office (WFO) in Wilmington, OH stating, "the warning (lead)time afforded officials in Porter Township to be proactive rather than just reactive in alerting citizens they were in harm's way."

Major flooding at the Best Care Nursing Home. ***Photo courtesy of Brennon E. Giles via WSAZ.***

Although the threat of damaging winds, large hail, and cloud-to-ground lightning had passed, flash flooding remained a threat into the evening hours on July 11th. At 5:00 pm, the Wilmington WFO issued a flood advisory for Scioto County, where heavy rainfall with the storm continued. By 5:24 pm, radar estimates of two to four inches prompted the Wilmington WFO to issue a flash flood warning for central Scioto County. At 6:02 pm, the Porter Township Fire Department and Rescue Squad responded to a call of flooding occurring at the Best Care Nursing Home in Wheelersburg. Two feet of water was reported running into the front entrance of the nursing home, where emergency personnel assisted in the evacuation of 88 patients. The occupants of the nursing home were taken to Wheelersburg High School, where a shelter was provided for the patients until noon on July 12th.

The timely and effective products issued by the WFO in Wilmington, OH provided emergency personnel the critical decision-making information needed to take appropriate action prior to the storm hitting the Wheelersburg area. The officials at the District 11 State Baseball Tournament and the Porter Township Fire Department should be commended for their efforts prior to the storm hitting Wheelersburg. The quick response to the tornado warning issued by the National Weather Service saved lives. Although a tornado did not hit the area, straight-line winds caused significant damage. The Porter Township Fire Department and Rescue Squad should also be commended for their outstanding efforts evacuating the Best Care Nursing Home during the flash flood. Following the event, Kim Carver reflected that, "Emergency Management in Scioto County has enjoyed a close relationship with the forecast staff at Wilmington and credits the on-going coordination of local and federal safety partners in weather forecasting as the key to saving lives and protecting property in the county." This event highlights the importance of a strong partnership among all local, county, state, and federal agencies or entities that have the mission to save lives and protect property.

Cincinnati Reds become StormReady®

Charlie Woodrum and Mary Jo Parker

Nearly 1800 students attended Cincinnati Reds Weather Day on April 9. The Cincinnati Reds were recognized at the Great American Ball Park as the second StormReady® Supporter team in major league baseball. The Reds are Ohio's first business organization to attain the StormReady® Supporter status. National Weather Service (NWS) staff from the Wilmington, Ohio, Weather Forecast Office (WFO) was on-site to honor the team before the first pitch.

Meteorologist-in-Charge, Kenneth Haydu (third from right), and Warning Coordination Meteorologist, Mary Jo Parker (second from right), present Declan Mullin (left), Phil Castellini (second from left), and Bary Lusby (right) from the Cincinnati Reds with a sign designating the team as a StormReady® Supporter. ***Photo courtesy of Jarrod Rollins.***

The Cincinnati Reds completed a number of tasks to earn this designation, including developing severe weather procedures, training staff on severe weather safety plans, and setting up a Facility Warning Point in order to monitor the current status of the weather during games.

"The cry 'take me out to the ballgame' is one that was common around my house as soon as baseball season started," said Kenneth Haydu, Meteorologist-in-Charge of the Wilmington WFO. "It feels like we struck a homerun by declaring the Cincinnati Reds StormReady® and hope all ballparks will follow their lead in ensuring sport stadiums can take quick action when faced with severe weather."

Meteorologist-in-Charge, Kenneth Haydu (back), Meteorologist Intern, Charlie Woodrum (middle), and Warning Coordination Meteorologist, Mary Jo Parker (front) greet visitors on Weather Day. ***Photo courtesy of Elizabeth Hardin.***

Reds Weather Day was planned by the Reds as part of the StormReady® program. The Cincinnati Reds organized this event in coordination with the local FOX television broadcast media outlet and the NWS to increase hazardous weather awareness for spectators. Students at the event were educated on the hazards of weather and how to develop a plan at home.

Kenneth J. Haydu presented StormReady® Supporter Signs to Phil Castellini, Chief Operating Officer of the Cincinnati Reds, and Declan Mullin, Vice President of Ballpark Operations. Also in attendance were Mary Jo Parker, Warning Coordination Meteorologist, and Barry Lusby, Deputy Director of Hamilton County Ohio Emergency Management Agency.

The Cincinnati Reds Weather Day was also the 10 year anniversary of the Blue Ash Tornado, which occurred near Cincinnati. Mary Jo Parker was interviewed about the event by Chief Meteorologist Steve Horstmeyer, from the FOX-19 television station in Cincinnati. This interview was used as part of the program at the Great American Ballpark prior to the start of the game.

At the NWS booth, spectators were educated on weather safety, challenged by a lightning quiz, and entertained by a thunder shaker and tornado tubes. With the success of this event and as part of their StormReady® Supporter plan, the Cincinnati Reds organization intends to hold Weather Day annually in order to increase severe weather safety awareness and improve their fans' safety during severe weather.

"We are so committed to making public sporting arenas StormReady®, we are using our successful partnership with the Cincinnati Reds to try to recruit Major League Baseball to spearhead other teams to join the StormReady® program," said Mary Jo Parker.

StormReady
NATIONAL WEATHER SERVICE

Interesting Photos from the Past Year

Photos courtesy of (from top left): Michelle Figgins, Brian Ellison, Samantha Hall, Bill Starr, Jay McCann, Mike Ryan, NWS Employee, Mike Kanavel, Collin Grove, Charlie Woodrum (NWS Employee) Ron Ciminero, Steve Horstmeyer, Dan Hawblitzel (NWS Employee).

The Great American Ball Park and downtown Cincinnati, Ohio -- by day and by night. ***Photos courtesy of Andy Hatzos (NWS Employee).***

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www.weather.gov/iln/